UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,085	12/06/2001	Jason Charles Pelly	450110-03708	5209

20999 7590 10/04/2005

FROMMER LAWRENCE & HAUG
745 FIFTH AVENUE- 10TH FL.
NEW YORK, NY 10151

EXAMINER	
KRONENTHAL, CRAIG W	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/007,085	PELLY ET AL.	
	Examiner	Art Unit	
	Craig W. Kronenthal	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-22 and 42* is/are allowed.

6)☒ Claim(s) *23-26,30-41 and 43* is/are rejected.

7)☒ Claim(s) *27-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 April 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/02, 12/04, 4/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed April 22, 2005, has been entered and made of record.

Response to Arguments

2. Applicant's arguments, see pages 17, 18, and 20, filed April 22, 2005, with respect to claims 1-22 and 42 have been fully considered and are persuasive. The rejections of claims 1-22 and 42 have been withdrawn.

3. Applicant's arguments with respect to claims 23-41 and 43 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

4. The drawings of Figures 5, 10, and 16 are objected to under 37 CFR 1.83(a) because they fail to show labels for each block as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary,

the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 37-41 are directed to non-statutory subject matter.

"A computer program providing computer executable instructions" should be replaced with "A computer program embodied in a computer readable medium for performing the steps of." Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 23-26 and 31, 32, 34-41, and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Cox et al. (EP 0 840 513 A) (hereinafter Cox). For clarification, the column and line citations below refer to Cox et al. (PN 5,915,027), which is the U.S. patent corresponding to the **EP 0 840 513 A** reference provided by the applicant in the information disclosure statement filed April 22, 2005.

Regarding Claim 23: Cox discloses an apparatus for detecting and recovering data embedded in information material, said data having been embedded in said information material by modulating a predetermined data sequence with the data to be embedded to form modulated data and combining said modulated data with said information material, said apparatus comprising:

- a correlation processor (correlators, Figure 3, 31a, 31b, etc.) operable in combination with a data sequence processor (PN Mapper, Figure 1, 11) to form a correlation sequence (each PN code) (col. 5 lines 42-48) [Each correlator (31a, 31b,etc.) tests for one PN code. The PN Mapper (11) is not shown in Figure 3, as being connected to the correlator, however, it is necessary in order to provide the correlator with the PN code.], and
- a data processor operable under control of the correlation processor (Watermark Identifiers in Figure 4, 44a, 44b, etc. contain correlators 31a, 31b, etc. as depicted in Figure 3) to correlate information material data symbols (Figure 4,

watermarked data), with which said modulated data have been combined, with said correlation sequence (each PN code), to form a correlation output signal (Figure 4, output of Watermark Identifiers 41a, 41b, etc.) representing the correlation between the information material data symbols and said correlation data sequence, and to recover said embedded data (Figure 4, Extracted Watermark Signal) from said correlation output signal [Each Watermark Identifier (44a, 44b, etc.) contains a bank of correlators (31a, 31b, etc.) used to correlate the watermarked image data with a PN code (col. 6 lines 15-18). Each correlator uses a different version of the PN code as was used by the PN Mapper (11) to modulate the watermark signal in the watermark insertion demonstrated in Figure 1 (col. 5 lines 46-48). The outputs of the correlators (31a, 31b, etc.) are provided to the decision circuit (Figure 3, 32) for determining which correlation with the different PN codes results in the most likely watermark (col. 5 lines 48-54). When the watermarks for the entire image are found they are combined and decoded to recover the extracted watermark (col. 6 lines 18-23).],

- wherein said correlation sequence (each PN code, col. 5 lines 46-48) comprises a plurality of predetermined data sequence versions, each of said versions being provided by shifting (cyclically rotated by one frequency coefficient) the predetermined data sequence (PN sequence) used to form said modulated data with respect to others of said versions (col. 8 lines 46-54) [The same PN sequence is shifted by one frequency coefficient for each block of the image to create different variations for use in modulating the watermark signal. The

correlators (31a, 31b, etc.) use each variation as a PN code to correlate with the watermarked image blocks.].

Regarding Claim 24: Cox discloses an apparatus as claimed in claim 23, wherein the number of said plurality of versions of said predetermined data sequences is equal to a number of possible relative shifts of the information material data symbols to which the modulated data have been added, each of said plurality of predetermined data sequences being shifted with respect to each other, each shift representing a number of symbols by which the information material data symbols may have been shifted (col. 8 lines 46-54) [The correlators (31a, 31b, etc.) will test for each PN code that is used to encode the symbol by the PN Mapper (11) (col. 5 lines 46-48), which in a particular embodiment includes each variation of the cyclically rotated PN sequence (col. 8 lines 46-54). Furthermore, the variations are shifted with respect to each other since each new variation is simply the previous PN sequence rotated by one frequency coefficient as illustrated in Figure 6.].

Regarding Claim 25: Cox discloses an apparatus as claimed in claim 23, wherein each of said predetermined data sequence versions is a different predetermined data sequence of a set of possible predetermined data sequences which may have been used to form said modulated data (col. 8 lines 46-54) [The analogous arguments of claim 24 are applicable to claim 25. The variations of the PN sequence are different

from one another and the set of possible sequences is the number of variations, which is dependent on the number of rows and columns of blocks being watermarked.].

Regarding Claim 26: Cox discloses an apparatus as claimed in claim 23, wherein said predetermined data sequence is a Pseudo Random Bit Sequence (pre-specified pseudo-random noise code, col. 4 lines 45-48).

Regarding Claim 31: Cox discloses an apparatus as claimed in claim 23, wherein said data is combined with said information material by forming a transform domain representation of said data and combining said data with said information material in either said transform domain or the inverse transform domain [The watermark is transformed into the frequency domain by the spectral transformer (Figure 1, 12), and then combined, with the frequency transformed data to be watermarked, by the spectral shaper (Figure 1, 14) (col. 4 lines 48-65). After the combination in the frequency domain the watermarked data in converted back into the spatial domain by the inverse transformer (Figure 1, 17).], said apparatus comprising:

- a transform processor (spectral normalizers, Figure 4, 41a, 41b, etc.) operable to generate a transform domain representation of said information material in which said data has been embedded (Watermarked Data, Figure 4), said correlation processor (correlators, Figure 3, 31a, 31b, etc. contained in the Watermark Identifiers, Figure 4, 44a, 44b, etc.) being operable to recover said embedded data symbols (Extracted Watermark, Figure 4) by correlating transform domain

data symbols with which said embedded data has been combined with said correlation sequence (col. 5 lines 35-54 and col. 6 lines 3-23) [The spectrum normalizers (41a, 41b, etc.) transform the watermarked data into the frequency domain so that it may be correlated with the frequency domain versions of the PN sequences.]

Regarding Claim 32: Cox discloses an apparatus as claimed in claim 31, wherein said transform is the discrete wavelet transform, the data symbols in the transform domain being divided into each of a plurality of sub-bands comprising wavelet coefficients, the data being added to at least one of the sub-bands (col. 4 lines 53) [It is inherent that if a wavelet transform is implemented by the spectral transformer (Figure 1, 12), then the data symbols would be divided into plural sub-bands, comprising wavelet coefficients, and the data would be added to a least one of the sub-bands.].

Regarding Claim 35: Cox discloses an apparatus as claimed in claim 23, wherein said information material is one of audio material (multimedia), video material (video) and audio/video (multimedia) information material (col. 1 lines 4-5).

Regarding Claim 36: The analogous arguments of claim 23 are applicable to claim 36.

Regarding Claim 37: The analogous arguments of claim 25 are applicable to claim 37.

Regarding Claim 43: The analogous arguments of claim 23 are applicable to claim 43.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox in view of Sharma et al. (PN 6,385,329) (hereinafter Sharma).

Regarding Claim 30: Cox discloses an apparatus as claimed in claim 23, but does not disclose reversing the polarity of predetermined data sequence versions. However, Sharma discloses wavelet-based watermark embedding wherein said correlation sequence (message signal comprising an array of positive and negative values) is formed by reversing the polarity of a predetermined data sequence (col. 33 lines 41-59). It would be obvious to one of ordinary skill in the art to modify Cox to reverse the polarity of the different versions of predetermined pseudo random signals as taught by Sharma. Furthermore one would have been motivated to make this modification to increase the imperceptibility of the watermark (col. 33 lines 31-35).

Regarding Claim 33: Cox discloses an apparatus as claimed in claim 26, but does not disclose the PN code being bipolar and modulating the symbols by reversing the sign of each bit. However, Sharma discloses wavelet-based watermark embedding wherein each bit of said PRBS (pseudorandom number) is represented in bipolar form (1 or –1), said data to be embedded modulating (spreading) the symbols (message) of said PRBS by reversing the sign of each bit, said modulated Pseudo Random Bit Sequences being combined with respective wavelet coefficients of said sub-band (the resulting message signal samples may be mapped to one or more wavelet coefficients) (col. 33 lines 41-59). It would have been obvious to one of ordinary skill in the art to modify Cox's PN code to be bipolar such that the signs of the watermark would be reversed. Furthermore, it would have been obvious to one of ordinary skill in the art to make this modification to increase the imperceptibility of the watermark (col. 33 lines 31-35).

Allowable Subject Matter

10. Claims 1-22 and 42 are allowed.

11. Claims 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on April 22, 2005 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig W. Kronenthal whose telephone number is (571) 272-7422. The examiner can normally be reached on 8:00 am - 5:00 pm / Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

9/23/05
CWK

JINGGE WU
PRIMARY EXAMINER